

Vayu on-the-spot report
ILA 2010

FROM ZEPPELIN TO AIRBUS

100 years
of the
Berlin Air Show



Making its first public debut, the A 400M flies above Schönefeld (with USAF C-17s and C-130s on static display).

With the largest ever participation in the chequered 100-year history of the ILA, the 1153 exhibitors from 47 countries (2008: 1,127/37) presented an impressive range of products and services from every area of the aerospace industry at ILA 2010 that took place 8-13 June in Berlin. Approximately 235,000 visitors (2008: 241,000) attended the fair. Compared with the previous ILA, the number of trade visitors increased slightly to 125,000 (2008: 120,000). Contracts and business agreements worth some 16.5 billion dollars were signed during the air show, the biggest single order being from the Emirates, which purchased a whopping 32 Airbus A380 aircraft at a total list price of some 11.5 billion dollars. According to Airbus, this agreement is the largest single order ever placed in the history of civil aviation. Airbus alone sold 67 aircraft during the ILA 2010, according to its CEO Dr. Thomas Enders.

Dietmar Schrick, President of the BDLI (organisers of the event), believes that the world's oldest aviation and space



Dominating the apron at Schönefeld was Emirates A380 mega airliner which, for a few hours, was parked nose-to-nose with a Lufthansa A380.

show was in a stronger position than ever in 2010: "On the basis of the business conducted during this year's show the ILA has again established itself as a top-ranking international aerospace event. In 2010 we have been able to record the single biggest order ever achieved at any aerospace show anywhere in the world.

The enormous growth in almost all sections of this event confirms the strength of the underlying concept and the ILA 2010 has set new standards."

Its international position as the leading combination of congress and trade show was underlined at the ILA 2010, which featured more than 100

accompanying conferences, seminars and workshops. These meetings, which were staged by many internationally renowned organisers, were attended by some 8,000 representatives of every area of business in the aerospace industry. The presence of more than 130 high-ranking delegations from all over the world ensured that ILA 2010 was an effective meeting place for business and science, politics and the military. They included 285 participants in the Parliamentarians' Day, who came from all over Europe, 65 representatives of embassies in Germany and some 250 delegates to the ILA Space Day, which was also attended by leading representatives of space agencies from the USA, Russia, Ukraine and Kazakhstan.

The ILA 2010 was also a media event of the first order. The 4,100 media representatives from 70 countries reported in word, images and sound on the events taking place at the Berlin Air Show, and their coverage provided worldwide publicity.

Just under 300 aircraft, considerably more than at any other of the world's air shows, were on display on the ground and in the air. Aircraft making their world, European or ILA debuts included the new A400M military transport aircraft, the Grob 120TP trainer, the CH-53GA (German Advanced) transport helicopter, which is equipped with the latest avionics and the DLR-H2 Antares, the world's first manned aircraft that uses a fuel cell system to eliminate all CO₂ emissions.

ILA 2010 was officially opened by Dr. Angela Merkel, Chancellor of the Federal Republic of Germany and guests at the ILA 2010 included the Swiss Federal President Doris Leuthard (Switzerland being the partner country this year, as India was in 2008). Speaking against the background of the first Lufthansa A380 and a prototype of the A400M military transport, which also made its international debut at the Air Show, Germany's Federal Chancellor Angela Merkel declared the ILA 2010 "ready for take-off" on 8 June. In his preceding welcoming address, the chief executive of Airbus and President of the BDLI, Dr. Thomas Enders, drew attention to the bright sunshine being enjoyed throughout Brandenburg. During her opening address Chancellor Merkel gave a brief run-down of the 100-year history of the International



Schiebel's S-100 Camcopter gave an overview of the ILA

The feeling that one was being watched at the ILA was no reason to be paranoid: making its debut in the skies over the ILA was the unmanned S-100 observation helicopter from the Austrian company Schiebel. The first pilotless VTOL system, the Camcopter showed off its capabilities with a daily programme of demonstration flights. Images from the daily airborne demonstrations were transmitted in real time to a visitors' screen at the Berlin Air Show. "We are particularly delighted to be able

to demonstrate the advantages of our unmanned helicopter to a wide audience for the first time at the ILA", said Hans Georg Schiebel, member of the board of the Schiebel group. "The perfect size and the agility of the S-100 make it an ideal UAS (Unmanned Aerial Vehicle). It has both civilian and military applications." These include surveillance over land and sea, mine-seeking from the air, the monitoring of communication lines and infrastructure, as well as surveying and filming.

Aviation Exhibition, "from Zeppelins to the Airbus." She described the A380 as a "perfect example of international cooperation and advanced technology". Merkel also added that technological developments have taken the risk out of

flying: "Materials research and the degree of precision that this requires are by no means confined to applications in the aviation field."

During his tour at the opening of this year's ILA the President and CEO



Aerial view of the static display at ILA 2010.

Martin Baker



The Pioneer Team (front); Consolidated PBY-5A Catalina, (back).

Air Berlin celebrates 50th A320



Berlin's 'flag carrier', Air Berlin, together with the manufacturer Airbus, used the centenary of the ILA as an ideal background for taking delivery of its 50th aircraft of the A320 series. President and CEO of Airbus, Thomas Enders, handed the aircraft over to the

CEO of Air Berlin, Joachim Hunold. Thomas Enders emphasised that, unlike many of its competitors, Air Berlin has not delayed taking delivery of aircraft that it has ordered because of the current economic crisis but has in fact added four more aircraft, ahead of schedule!



EADS presented an innovative hybrid helicopter concept.

of Emirates Airlines, Sheikh Ahmed bin Saeed Al-Maktoum, in the presence of Federal Chancellor Angela Merkel, announced that his airline had ordered a further 32 A380s from Airbus. This brings the total number of orders for this model to 90 for this airline and at present ten of the world's largest passenger aircraft are already in service with Emirates.

Eurocopter used this year's ILA Berlin Air Show to highlight its international market strength and its continuing ability to innovate. The company's display featured the Tiger combat helicopter and NH90 NATO Fregate Helicopter – both of which are in service with several nations. A new medical evacuation (MedEvac) variant of the NH90 developed by Eurocopter with a view to future German military requirements, as well as a large array of the company's civil helicopters, was shown in the HeliCentre static display and on the EADS Group's booth.

The Tiger, which is being delivered to Germany, France, Australia and Spain, demonstrated its spectacular maneuverability in the air show's daily flying display. French Army Tigers have been successfully deployed in Afghanistan since mid-2009. The NH90 – of which 529 units are on order by 14 nations, and which is Europe's largest military helicopter programme – is being delivered to Germany, Sweden, Italy, Australia, Finland, the Netherlands and France, with deliveries to further customers to commence this year. The NH90 in its naval variant, which is operated by the Royal Netherlands Navy, was on display (and is on offer to India as well.)

At ILA 2010, EADS showcased the world's first flight of an aircraft powered by pure biofuel made from algae. A Diamond Aircraft DA42 New Generation powered by two Austro Engine AE300 engines took part in the daily flight demonstrations. Thanks to the higher energy content of the algae biofuel, fuel consumption of the Diamond DA42 New Generation is 1.5 litres per hour lower when compared to conventional JET-A1 fuel, while maintaining equal performance. Tests also proved that only relatively minor modifications and adjustments had to be made to the aircraft's engines to qualify the biofuel from algae for the demonstration flights.

Return of “Auntie Ju”

The 100 years of ILA are also 100 years of aviation history. One of the major milestones in aviation was the Junkers F 13, the world’s first all-metal passenger aircraft, a replica of which is now being constructed and is likely to take to the air in 2012. Three highly qualified partners are working towards this objective: Verein der Freunde Historischer Luftfahrzeuge e.V. (VFL), the well known manufacturer of travel goods RIMOWA and the Swiss company JU-AIR, which already operates a Ju-52, which was based on the F 13. The German Technology Museum in Berlin is also involved, because its exhibits include an original F 13, which can be used as the pattern for the new replica. For the VFL the six-seater F 13 will probably replace the aircraft with the registration HB-HOY in 2010. The latter is a Ju-52 built under licence in Spain and due to be withdrawn from service this year, which flew into the ILA on 10 June. This ambitious project, which was presented



in detail at a press conference, is also intended to be funded through the sale of donors’ certificate, some of which will also incorporate pieces of metal from an original F 13.

Messerschmitts over Schönefeld

One of the most popular aircraft with the public at the show was the Messerschmitt Me-109G ‘Red Seven’. Like its younger and faster sister, the Me 262, it also belongs to the Willy Messerschmitt Foundation’s Flying Museum in Manching and featured in impressive displays during the public days at the ILA. Its pilot for the last four years has been Klaus Plasa, a career pilot and flying instructor on the C-160 Transall transporter flown by the German air force, as well as a highly trained test pilot. Plasa has amassed some 12,000 flying hours, but the Messerschmitt Me-109 is still something special for him: “Above all what makes this aircraft so different is its original engine, a DB-605A. It is currently the only one powered by this engine. The 109 is certainly demanding but it is a great pleasure to fly.”



Algae are considered to be promising potential feedstock for biofuels, as certain species of algae contain high amounts of oil. This oil can be extracted, processed and refined for various uses. Grown for

many years on a commercial basis for the development of products such as food supplements and cosmetics, microalgae have now emerged as one of the leading sources for alternative fuels.



Eurofighter Typhoon with afterburners on at the flying display.



Northrop F-5E Tiger IIs of the Patrouille Suisse, formation aerobatic team of the Swiss Air Force.

“Our pure bio fuel flight from algae is a world first and an exciting milestone in our research at EADS.” says Dr. Jean Botti, Chief Technical Officer (CTO) of EADS. “This opens up the feasibility of carbon-neutral flights and we will continue to focus our research in this exciting area. Third generation biofuels are more than just a replacement for fossil petroleum - they push the possibilities of future propulsion.”

EADS also presented an innovative hybrid helicopter concept. EADS Innovation Works, the corporate research and technology network of EADS develops diesel-electric hybrid concepts as part of the Group’s research to make helicopters more environmentally friendly. Highly efficient electrical motors driving the rotors, combined with diesel engines, reduce fuel consumption and emissions by up to 50 percent. The main components of this patented hybrid system are multiple diesel-electric motor-generator units, a pair of high-performance batteries and a power electronics unit controlling the energy flows for best efficiency. The four independent energy sources of this kind of propulsion system ensure very high levels of flight safety and efficiency. Several different kinds of combustion engines could be integrated



Eurocopter Tiger UHT.

into such a hybrid system. The hybrid system architecture allows the main rotor and its electrical drive to be tilted forward during cruise flight. This enables the helicopter’s fuselage to remain at its optimum alignment with the airstream, minimising aerodynamic drag and thereby reducing the power demand and fuel consumption. Since the tail rotor has no mechanical linkage to the main rotor and its power source, it can be turned off at higher

EADS Defence & Security in India

EADS Defence & Security (DS) has always considered India as a “fast growing market with an expanding defence and security industry which offers excellent opportunities for partnerships. Therefore DS is fully committed to invest in India’s industry and people and is ready to listen and learn from its Indian customers”, stated Dr. Stefan Zoller (CEO EADS Defence & Security). “Already existing partnerships with R&D organisations such as the Defence Research and Development Organisation (DRDO) and Defence Avionics Research Establishment (DARE) build a solid basis to expand future partnerships with Indian companies. As another step to enhance its industrial footprint in this important growth market, DS created EADS DS India Private Ltd. which will be the primary point of contact for all customers in India” he said.

DS supports the armed forces in India with advanced sensor technology which meets the requirements of modern self-protection and defence systems. The Division offers entire spectrum of multi-function fire control radars, stand-off and penetrating surveillance and reconnaissance radars as well as navigation and terrain-following radars.

DS concentrates its capabilities in the fields of combat aircraft, manned mission aircraft, unmanned aerial vehicles (UAVs) including research and development of unmanned combat aerial vehicles (UCAVs) within Military Air Systems. The Business Unit is also responsible for complex airborne systems including development, production and integration stages as well as training services and comprehensive system support during the entire in-service phase. Major programme is the Eurofighter Typhoon which is developed and manufactured by Alenia Finmeccanica (Italy), BAE Systems (UK) and EADS (Germany, Spain). On behalf of the Eurofighter consortium, DS had submitted the bid proposal for the Medium –Multi Role Combat Aircraft



(L-R): Bernd Wenzler (CEO Defence Electronics EADS), Dr. Stefan Zoller (CEO EADS Defence & Security) and Bernhard Gerwert (CEO Military Air Systems EADS) addressing the Indian media at a round table during the show.

(M-MRCA) competition on 28 April 2008 and its offset offer on 4 August 2008. The Field Evaluation Trials for Eurofighter Typhoon started in November 2009 with training sessions of IAF pilots in Germany. In February-March 2010, two combat aircraft of the German Air Force demonstrated their operational capabilities in Bangalore, Leh and Jaisalmer. In April 2010, the trials were successfully completed with maintenance demonstrations and weapon demonstrations in Europe.

Together with the Aerospace Development Agency (ADA) based in Bangalore, DS signed a consultancy contract for future cooperation on the Light Combat Aircraft (LCA). “DS will use all its technological know-how, competence and expertise to make India’s LCA a real success.”



EADS CTO Jean Botti with the Diamond Aircraft DA42



Bundeswehr's Unmanned Aerial Reconnaissance Systems (UAS) Heron 1.

speeds. During these flight phases, stability and control as well as balancing of the rotor torque are provided by the aerodynamic properties of the helicopter's tail fin and rudder.

Germany's armed forces, the Bundeswehr, presented some selected capabilities of the Army, Air Force, Navy, Joint Medical Service and Joint Support Service at the ILA. On 10 June, attention focussed on the subject of *The Bundeswehr's Unmanned Aerial Reconnaissance Systems (UAS)*. The use of unmanned military aircraft opens up a new chapter for the Bundeswehr and such

systems are becoming increasingly important for reconnaissance purposes. The Bundeswehr has been using the Heron 1 system in Afghanistan since March this year. It has been developed by Israeli Aerospace Industries (IAI) with logistical support from the German company Rheinmetall. Flying at a maximum height of 10,000 metres this pilotless aircraft operates at speeds of up to 200 kilometres per hour and can remain aloft for up to 16 hours. The UAV provides images in real time.

VSC

Super Hercules at Schönefeld

The C-130J Super Hercules continues to notch up more successes, exuded James M. Grant, Lockheed Martin's Vice President Air Mobility and Special Operations Forces Programmes. The upgraded version of the tried and tested American transport aircraft has recorded more than 600,000 flying hours during operations with the armed forces of six countries, from freight drops over Afghanistan to mercy flights during all major aid missions in recent years. Grant emphasised that Lockheed Martin is constantly striving to achieve further improvements in the performance and mission capabilities of the C-130J. Ten customers have placed orders for this model. On 27 May Kuwait ordered three KC-130J airborne refuelling versions and the first of 17 aircraft were delivered to the Canadian armed forces on 4 June. Lockheed Martin is currently holding discussions with other potential customers and is expecting orders from the Middle East and Asia. The first C-130J for the Indian Air Force will be delivered in early 2011.



Airbus A400M prototypes flight trials "as planned"



Flight trials of the new military transporter, the Airbus A400M, are proceeding "as planned" said Domingo Ureña-Raso, Executive Vice President Airbus Military at ILA 2010. The first two prototypes – one of which demonstrated its capabilities during displays at the air show – have completed 62 take-offs and landings and 250 flying hours as part of the programme of flight trials, and a total of 3,700 hours will be required in order to achieve type certification at the end of 2011, reports Francisco Navarro Celada, Vice President Marketing for the Military Aircraft Division of Airbus. A third prototype will be joining the trials shortly, while the fourth is in the final assembly stage and is due to fly at the end of the year. The fifth prototype will reach the final assembly lane in the third quarter of 2010 and an A400M with the serial number '7' will be the first to be delivered to a customer following that model's maiden flight at the end of 2012.

Indian Eyes at Schönefeld

The Indian Defence Minister gave his inaugural speech, the Indian Air Force's 52-manned band played German melodies, HAL Dhruv ALHs performed over Berlin-Schönefeld airport, the 1200 sqm Indian pavilion was all decked-up to receive visitors, the Indian MoD organised a special seminar at the VIP Conference Hall..."

Déjà vu? Not quite. That was two years ago, as recorded in Vayu's Issue IV/2008. This time around, the Indian presence was muted, the chalet deserted and the only Indian aircraft were Dornier 228s but nobody knew of their origin. The Swiss company Ruag showcased three Dornier 228s painted in resplendent hues and announced increasing world interest in ordering this sturdy light transport aircraft 'made in Germany'. It took a *Show Daily* to reveal that 'the new Ruag Do 228 NG is manufactured in India... and finished here'.

It is a matter of fact that the HAL-built Do 228 has generated much market interest from as diverse potential customers as in Japan, Norway, the Maldives, Nepal, Greece but also Germany itself – and China. The aircraft is built in India (Kanpur) but finished in Germany (Oberpfaffenhofen) and HAL has long had the exclusive rights to build and sell

the aircraft anywhere in the world.

Is anyone listening?

Indian visitors focused on another aircraft: the Grob 120TP, which has been offered as a basic trainer aircraft for the Indian Air Force. Its German manufacturer, Grob Aircraft, submitted their response to the IAF in April along with Pilatus of Switzerland; Hawker Beechcraft of the US; Alenia of Italy and Korea Aerospace Industries for the IAF purchase of 75 trainer aircraft.

As the inimitable Ajai Shukla wrote from Berlin, "the search for a new trainer has begun in earnest and Grob's aggressive two-pronged strategy targets not just the 75 trainers in the tender, but the 106 trainers that HAL proposes to build as a joint venture. Given HAL's technological excellence in manufacturing composites cheaply, Grob is happy to source from HAL. The IAF will be happy with a single basic trainer that is already training Israeli, French, German and Canadian air force pilots, rather than waiting for an untried HAL trainer. And HAL would



Modelled on the 'Eye of Ra', an ancient Egyptian symbol of protection and power, this was painted on the cockpit of Grob's G520 high altitude research and surveillance aircraft on display at ILA 2010.

have eliminated developmental risks, while obtaining an assured customer."

"Technologically, Grob is on solid ground; the Grob 120TP is two generations ahead of the HPT-32 and is the world's lightest trainer with Martin Baker Mk.15B ejection seats for both pilots. The Grob 120TP's digital glass cockpit, built by Israeli company Elbit, allows trainee pilots to fly mission-specific sorties that were only possible earlier in advanced trainers. Finally, Grob claims this trainer, built entirely of maintenance-free, lightweight composites, is half the price of its rivals and three times cheaper to fly and maintain" (see separate item).

The Eurofighter Typhoon is one of the



One of the three Ruag Do228 NGs on display at the Berlin Air Show.

six contenders for the IAF's M-MRCA requirement and there were daily flight displays by this new generation multi-role combat aircraft, the joint development of four countries and now in front line service with the Air Forces of Germany, Britain, Italy and Spain but also with Saudi Arabia and Austria. The Luftwaffe Chief was on record that equipping Eurofighter for close air support is of special importance. The only other contending fighter types at ILA 2010 were the Saab Gripen (of the Hungarian Air Force) and an early model F-18 of the Swiss Air Force. Unlike ILA 2008, there were no F-16Cs this time while the Rafale and MiG-35 were not there even in model form.

On static display was one of the Luftwaffe's Heron UAVs, presently operational in Afghanistan even as



James Pearse of Martin-Baker explains the installation of their Mk.15B light weight ejection seat in the Grob 120TP basic trainer aircraft. Behind him is Johann Heitzmann, CEO of Grob Aircraft.



Dr. Krishnadas Nair of SIATI with Michael Schieschke of Zeppelin NT from Friedrichshafen.



Not the HAL that you know! 'High Altitude Long Endurance' VFW 614 test aircraft belonging to the DLR.

Diamond aircraft of Austria has partnered with a US company to use its light twin aircraft as the basis of an OPV (optionally piloted vehicle) which is planned to fly in September. Of pertinence to India is the Grob G520 high-altitude research and surveillance aircraft as a UAV/OPV, and the mock-up on display at ILA static park raised much interest. The Grob 520 has established five world records for altitude (53,574 ft), time to climb and flight endurance (30hrs with 1 tonne payload).

There was an Indian Civil and Defence Aerospace Seminar organised by SIATI, Aeromag Asia, and the BDLI at the ILA conference centre on 9 June where Dr CG Krishnadas Nair gave an overview of opportunities in this sector.



Not overcrowded! The Indian Ministry of Defence chalet at ILA 2010.

Contending for the IAF's BTA requirement : Grob's I20 TP



Grob Aircraft AG presented the latest version of its established 120 model at the ILA. The G 120TP, powered by a Rolls-Royce M250-17BF engine, has a new glass cockpit from Elbit Systems and a lightweight Mk.15B Martin Baker ejector seat, which only increases the empty weight of the aircraft by 24 kilogrammes. When tendering for many air force contracts, one prerequisite has been that basic and advanced versions of the same trainer must be available, providing a direct transition to the operational version, according to the CEO of Grob, Johann Heitzmann. The company is bidding to supply 75 of its G 120TP model to the Indian Air Force and 16 to the Indonesians. Grob is currently developing a tandem-seat version.

Grob also exhibited the high altitude G520 Egrett at ILA. The company is keen to reactivate its business in the specialist field of high altitude reconnaissance and monitoring aircraft and for this purpose has formed the DEGOSS consortium together with the German Aerospace Centre, ESG and OHB-Systems. A further development of the G 520



The 21st Century cockpit for the Grob 120TP developed by Elbit.

is intended to create an unmanned aircraft system in the form of an Optional Piloted Vehicle (OPV) which, in addition to being remotely controlled, could be flown conventionally, by a pilot in controlled airspace which is considered cost-effective and 'real world.'